UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 7,050,169 B2 Page 1 of 6
APPLICATION NO. : 10/645331
DATED : May 23, 2006
INVENTOR(S) : Aydogan Ozcan et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On Page 2, Col. 1 ("U.S. Patent Documents"), line 15, after 6,650,486, delete "**B1**" and insert -- **B2** --.

On Page 2, Col. 1 ("U.S. Patent Documents"), line 16, after 6,856,393, delete "**B1**"and insert -- **B2** --.

On Page 2, Col. 1 ("Other Publications"), line 9, delete "**technique**" and insert -- **technique** --.

On Page 2, Col. 1 ("Other Publications"), line 18, after "**Ozcan**", delete "A." and insert -- **A.,** --.

On Page 2, Col. 2 ("Other Publications"), line 7, delete "**Search.**." and insert -- **Search.**" --.

On Page 2, Col. 2 ("Other Publications"), line 8, delete "**Marker**" and insert -- **Maker** --.

On Page 2, Col. 2 ("Other Publications"), line 14, delete "**(1988),**" and insert -- **(1998),** --.

On Page 2, Col. 2 ("Other Publications"), line 29, after "**SPIE**", insert -- , --. [comma]

On Page 2, Col. 2 ("Other Publications"), line 48, delete "**Fringes**" and insert -- **fringes** --.

On Sheet 2 of 39, Box 140 (Fig. 2), Line 1, delete "**NONLINEARIITY**" and insert -- **NONLINEARITY** --.

In Col. 2, line 30, delete "$f(\theta n_1, n_2)$" and insert -- $f(\theta, n_1, n_2)$ --.

In Col. 4, line 51, delete "**obtaines**" and insert -- **obtains** --.

In Col. 8, line 64, delete "**n.**" and insert -- **n.** --.

In Col. 9, line 1, delete "**n.**" and insert -- **n.** --.

In Col. 9, line 43, delete "**20 180°**" and insert -- **20 at 180°** --.

In Col. 15, line 45, delete "**LG**" and insert -- $\mathbf{L_G}$ --.

In Col. 15, lines 57-58 (approx.), delete Equation 8 as set out in the patent grant, and insert

-- $$MF_{S1} = \left|D^{S1}(f)\right|^2 = \left|D_A(f) - D_B(-f)\right|^2 = \left|\left|D_A(f)\right|e^{j\phi_A(f)} - \left|D_B(f)\right|e^{-j\phi_B(f)}\right|^2$$ --.

In Col. 15, line 60 (approx.), delete Equation 9 as set out in the patent grant, and insert

-- $$MF_{S2} = \left|D^{S2}(f)\right|^2 = \left|D_A(f) + D_B(f)\cdot e^{-j2\pi fL}\right|^2 = \left|\left|D_A(f)\right|\cdot e^{j\phi_A(f)} + \left|D_B(f)\right|\cdot e^{j[\phi_B(f)-\phi_0(f)]}\right|^2$$ --.

In Col. 15, line 64 (approx.), delete "$\mathbf{MF_{S1\ and\ MFS2}}$" and insert -- $\mathbf{MF_{S1}}$ **and** $\mathbf{MF_{S2}}$ --.

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In Col. 15, line 65, delete Equation 10 as set out in the patent grant, and insert

-- $MF_{S1} = |D_A|^2 + |D_B|^2 - 2|D_A||D_B|\cos(\phi_A + \phi_B)$ --.

In Col. 15, line 67 (approx.), delete Equation 11 as set out in the patent grant, and insert -- $MF_{S2} = |D_A|^2 + |D_B|^2 + 2|D_A||D_B|\cos(\phi_A - \phi_B + \phi_0)$ --.

In Col. 16, line 24 (approx.), delete Equation 14 as set out in the patent grant, and insert -- $\phi_A + \phi_B = 2\pi \cdot m \pm \left|\cos^{-1}\left(\frac{\alpha}{\Delta}\right)\right|$ --.

In Col. 19, line 9 (approx.), after "**magnitude**", insert -- **of** --.

In Col. 19, line 24 (approx.), after "**magnitude of**", delete "**(i.e., the Fourier transform magnitude of**".

In Col. 20, line 1, delete "y" and insert -- **yield** --.

In Col. 20, line 18 (approx.), delete " $2|D_A|P_1$ **and** $2|D_A|P2$ " and insert -- $2|D_A|P_1$ **and** $2|D_A|P_2$ --.

In Col. 20, line 24 (approx.), delete the equation following the word "**measured**" and before the word "**data**", and insert $MF(f) = |D_A(f)|^2$ -- --.

In Col. 21, line 31, delete the equation following the words "**Equation 2**", and insert -- $MF_{S1} = 4|D_A|^2 \sin^2(\phi_A)$ --.

In Col. 21, line 44, delete the symbols following "**i.e.**", and insert -- $MF_{S1} = 4|D_A|^2 \sin^2(\phi_A)$ --.

In Col. 21, line 45, delete the symbols following the word "**of**" and before the period, and insert -- $d(z) - d(-z)$ **is** $2j|D_A|\sin(\phi_A)$ --.

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In Col. 21, line 53, delete "**dz)**" and insert -- **d(z)** --.

In Col. 21, line 58, delete "**nonlinearitly**" and insert -- **nonlinearity** --.

In Col. 23, line 30 (approx.), delete "**dS2(z),**" and insert -- $\mathbf{d_{S2}(z)}$, --.

In Col. 23, line 32 (approx,), delete Equation 28 as set out in the patent grant, and insert

-- $MF_{S1} = |D_A|^2 + |D_B|^2 - 2|D_A||D_B|\cos(\phi_A + \phi_B + \phi_1)$ --.

In Col. 23, line 34 (approx.), delete Equation 29 as set out in the patent grant, and insert

-- $MF_{S2} = |D_A|^2 + |D_B|^2 + 2|D_A||D_B|\cos(\phi_A - \phi_B + \phi_2)$ --.

In Col. 23, line 37 (approx.), delete the equation following the word **and**, and insert -- $\phi_2(f) = 2\pi fL$ --.

In Col. 23, line 43 (approx.), delete "$\mathbf{MFS_2}$" and insert -- $\mathbf{MF_{S2}}$ --.

In Col. 24, line 8, after MF_B, insert -- , --. [comma]

In Col. 24, line 10, delete "**z<0**" and insert -- $\mathbf{z \leq 0}$ --.

In Col. 26, line 10, delete "**220,a**" and insert -- **220, a** --.

In Col. 26, line 12, delete "**230,an**" and insert -- **230, an** --.

In Col. 27, line 41, delete "$\int_{pump,1}$" and insert -- $\omega_{\text{pump},1}$ --.

In Col. 29, line 22, delete Equation 41 as set out in the patent grant, and insert

-- $u_{out}(t) \approx u_t(t) * u_r(-t) * u_s(t) e^{j\vec{K}_1\vec{r}} + u_t(t) * u_r(t) * u_s(-t) e^{j\vec{K}_2\vec{r}}$ --.

In Col. 29, line 64, delete "**produ$_c$t**" and insert -- **product** --.

In Col. 30, line 27 (approx.), delete Equation 45 as set out in the patent grant, and insert -- $E_{2\omega}(t) = u_{2\omega}(t)e^{j2\omega t} = \eta_{u1}(t)u_2(t)e^{j2\omega t} = \eta_{u1}(t)u_1(t-\tau)e^{-j\omega\tau}e^{j2\omega t}$ --.

In Col. 30, line 30, delete the symbol following the word "**where**" and before the word "**is**" as set out in the patent grant, and insert -- η --.

In Col. 30, line 30, after "**to**", delete ",". [comma]

In Col. 30, line 51 (approx.), delete Equation 47 as set out in the patent grant, and insert -- $\overline{A}_{PMT\_single}(f) = |\eta|^2 |\bar{I}(f)|^2$ --.

In Col. 31, line 34, delete "**At**" and insert -- Δt --.

In Col. 31, line 60 (approx.), delete Equation 50 as set out in the patent grant, and insert -- $\overline{A}_{PMT\_double}(f) = 2|\eta|^2 |\bar{I}(f)|^2 |1 + \cos(2\varphi(f) - f\Delta t)|$ --.

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In Col. 32, line 13, delete the symbols following the word "**signal**" and before the word "**recorded**", and insert -- $A_{PMT\_single}(\tau)$ --.

In Col. 32, line 33, delete the symbols following the words "**magnitude of**" and before the words "**(expressed by**", and insert $\tilde{A}_{PMT\_double}(f)$ -- --.

In Col. 32, line 35, delete the symbols following the word "**measured**" and before the period, and insert -- $A_{PMT\_double}(\tau)$ --.

In Col. 32, line 36, delete the symbols following the word "**measured**" and before the words "**is a**", and insert -- $A_{PMT\_double}(\tau)$ --.

In Col. 32, line 38, delete the symbols following the word "**signal**" and before the word "**measured**", and insert -- $A_{PMT\_single}(\tau)$ --.

In Col. 32, line 41 (approx.), delete the symbols following the word "**measured**" and before the words "**(i.e., from. . .**", and insert -- $A_{PMT\_double}(\tau)$ --.

In Col. 33, line 43 (approx.), delete the symbols following the word "**transform**" and before the words "**is equivalent**", and insert -- $\tilde{I}_{symmetric}(f)$ --.

In Col. 33, line 48 (approx.), after "**(i.e.,**", delete "**(i.e.,**".

In Col. 34, line 13 (approx.), delete "**su$_c$h**" and insert -- **such** --.

In Col. 34, line 23 (approx.), delete Equation 52 as set out in the patent grant, and insert -- $u_s(t) = \tilde{u}_s(t)e^{j\omega_c t}$ --.

In Col. 34, line 25 (approx.), delete the symbols following the word "**where**" and before the words "**is the**", and insert -- $\tilde{u}_s(t)$ --.

In Col. 34, line 28 (approx.), delete Equation 53 as set out in the patent grant, and insert -- $u_s(t) = \int \tilde{U}_s(\omega - \omega_c)e^{j\omega t}d\omega$ --.

In Col. 34, line 31 (approx.), delete the symbols following the word "**where**" and before the word "**denotes**", and insert -- $\tilde{U}_s(\omega)$ --.

In Col. 34, line 31 (approx.), delete the symbols following the words "**transform of**" and before the period, and insert -- $\tilde{u}_s(t)$ --.

In Col. 34, line 33 (approx.), delete the symbols following the words "**with amplitudes**", and insert -- $\tilde{U}_s(\omega - \omega_c)$ --.

In Col. 34, line 36, delete the symbols following "**(i.e.**", and insert -- $\tilde{U}_s(\omega - \omega_c)e^{j\omega t}$ --.

In Col. 34, line 40, delete the symbols following the word "**harmonic**" and before the words "**at the plane**", and insert -- $\tilde{U}_s(\omega - \omega_c)e^{j\omega t}$ --.

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In Col. 35, line 26 (approx.), delete Equation 57 as set out in the patent grant, and insert -- $u_{2s}(x';t) = \int \tilde{U}_{2s}(x';\omega,t)d\omega$ --.

In Col. 35, line 47 (approx.), delete Equation 59 as set out in the patent grant, and insert -- $u_{total}(t) = \left(\tilde{u}_s(t) + \tilde{u}_s^*(-t-\Delta t)\right)e^{j\omega_c t}$ --.

In Col. 36, line 1, delete the equation following the word "**Defining**" and before the word "**and**", and insert -- $\tilde{U}_s(\omega) = \left|\tilde{U}_s(\omega)\right|e^{j\Phi(\omega)}$ --.

In Col. 36, line 41, delete the symbols following the word "**function**" and before the comma, and insert -- $\tilde{u}_s(t)$ --.

In Col. 36, line 47 (approx.), delete the symbols following the word "**function**" and before the words "**to be characterized**", and insert -- $\tilde{u}_s(t)$ --.

In Col. 37, line 9, delete the symbols following the word "**function**" and before the comma, and insert -- $\tilde{u}_s(t)$ --.

In Col. 37, line 11, delete the symbols following the word "**function**" and before the words "**can be**", and insert -- $\tilde{u}_s(t)$ --.

In Col. 37, line 27 (approx.), delete the symbols following the word "**function**" and before the words "**of any**", and insert -- $\tilde{u}_s(t)$ --.

In Col. 38, line 36, delete "**su,h**" and insert -- **such** --.

In Col. 39, line 18 (approx.), delete Equation 66 as set out in the patent grant, and insert -- $I_{C2}(t) = I_A(t) + I_B(-t + \tau_2)$ --.

In Col. 39, line 20, delete "**r2**" and insert -- τ_2 --.

In Col. 39, line 53 (approx.), delete the symbols following the word "**and**" and before the words "**a time**", and insert -- τ **is** --.

In Col. 39, line 58 (approx.), delete Equation 68 as set out in the patent grant, and insert -- $\left|I_C(f)\right|^2 = \left|I(f)\right|^2 + \left|I_{Ref}(f)\right|^2 + 2\left|I_{Ref}(f)\right|\left|I(f)\right|\cos\left(\phi - \phi_{Ref} + \phi_0\right)$ --.

In Col. 39, line 60, delete the equation following the word "**where**" and before the words "**is the Fourier**", and insert -- $I(f) = \left|I(f)\right|e^{j\phi}$ --.

In Col. 39, line 63, delete the symbols following the word "**with**" and before the period, and insert -- $\varphi_0 = 2\pi f\tau$ --.

In Col. 40, line 7, delete the symbols following the words "**transforms of**" and before the word "**and**", and insert -- $\left[\left|I(f)\right|^2 + \left|I_{Ref}(f)\right|^2\right]$ --.

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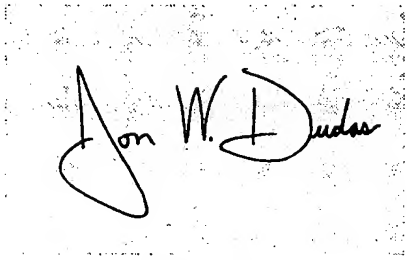
In Col. 40, line 11, delete the symbols following the word "**both**" and before the word "**and**", and insert -- $\left[I(f)\right|^2+\left|I_{Ref}(f)\right|^2\right]$ --.

In Col. 40, line 20, delete the symbols following the word "**quantities**" and before the word "**and**", and insert -- $\left[I(f)\right|^2+\left|I_{Ref}(f)\right|^2\right]$ --.

In Col. 40, line 31, delete "**q)**" and insert -- φ --.
In Col. 42, line 30, delete "**first-reference**" and insert -- **first reference** --.

Signed and Sealed this

Fourteenth Day of November, 2006



JON W. DUDAS
Director of the United States Patent and Trademark Office